

hour-circle revolves independently of the instrument, and is carried by clock-work, the moving power of which is a water-mill, regulated by "Siemen's *Chronometric Governor*." This is so successfully applied, that the rate of the hour-circle is not sensibly altered by clamping the polar axis to it. When the hour-circle is properly adjusted, the instrument reads off right ascensions at once.* The polar axis, which is of wrought iron-plate, is very massive and stiff. The weight of the whole instrument is between 70 and 80 cwt. This keeps all steady, even in very hard gales. The instrument is abundantly supplied with eye-pieces and micrometers. The stiff frame and large circles were evidently designed by Mr. Airy to supply a peculiar power to the instrument. In ordinary mountings, great accuracy is not to be expected when the star of reference is more than a few minutes distant from the object compared. The screw of the micrometer is not to be relied upon for larger spaces, and the circles, though sufficient for finding and identifying, are seldom intended for accurate measures. Stars of comparison can, indeed, generally be found which are contained in some of the special and extended catalogues, but such stars can only be considered to be roughly known, and in many cases fail altogether. The Liverpool equatoreal is intended to measure *by its circles* intervals of a few degrees, with as much accuracy as the average stars of our extensive catalogues possess, and thus to give excellent places by reference to well-known stars.

Mr. Hartnup has made some observations to test the powers of his equatoreal in this respect. The observations of γ , α , β *Aquilæ*, of α and β *Lyræ*, of *Castor* and *Pollux*,† shew satisfactorily, that within such limits as these the instrument will measure differences of right ascension and north polar distance almost, if not altogether, as well as can be expected from the best meridian instruments.

Mr. Hartnup further remarks, that the instrument keeps its adjustments steadily, which seems to shew that it is not only firm in itself, but, also, that it rests on a sound foundation. The observations by Mr. Hartnup, of standard stars in all parts of the heavens, are not sufficiently numerous to yield a safe estimate of the probable error of a single independent determination, but it is evidently very small, even for stars at 6^h from the meridian.

Mr. Bishop's Ecliptic Charts, from Observations at the South Villa Observatory.

Our treasurer, Mr. Bishop, has lately published the first hour of an ecliptic chart for the epoch 1825. This contains all the stars to the 10 mag. inclusive in a zone of 6° of latitude, 3° on each side

* This contrivance is peculiar to the equatoreals of Cambridge and Liverpool, and in some researches is of great convenience.

† These observations are given in detail in the accompanying memoir.

the ecliptic. The scale is 1·2 inches to 1° , which gives a clear and open map. The execution is very good.

In the notice which accompanies the chart Mr. Bishop says, "It is the first of a series of twenty-four charts, which I hope to publish. . . . The discovery of planets is materially facilitated by mapping down the stars within a few degrees on each side the ecliptic; and it is for this purpose I have undertaken the present series of charts. . . . The stars included in Weisse's Catalogue from Bessel's Zones were first laid down for 1825 as points of reference. All other stars, to the tenth magnitude inclusive, were then entered by estimation of their positions with respect to the neighbouring members of Weisse's Catalogue. . . . The charts for the hours of right ascension in which the ecliptic falls beyond the declination limits of the Berlin maps (-15°) are in a state of forwardness, and will be published as soon as they are completed. They are regularly compared in their present state with the heavens, so that the search for planets and the formation of the charts are going on at the same time. . . . I take this opportunity of expressing my warmest thanks to Mr. J. R. Hind, for the great care and indefatigable zeal he has displayed in the formation of this chart, which, to my knowledge, he has examined with the heavens from fifty to sixty times; but the success of his research, as shewn by the discovery of two planets, speaks for itself, and will, I am sure, dispose astronomers to receive these charts with confidence."

The charts are published by Messrs. Taylor, Walton, and Maberly, Gower-street, London.

Extract of a Letter from Lieut. Gilliss, U.S.N.*

"The computations for the longitude of Washington, from corresponding moon-culminations observed by me between 1838–1842, are nearly completed. The results for 1839 and 1840 give the following corrections of the (hitherto received) longitude:—

1st Limb	—	$5^{\circ}39'$	by 182 comparisons	
2d Limb	—	$4^{\circ}41'$	74	—
Mean	—	$4^{\circ}84'$	256	— according to weight.

The European observatories with which the comparisons are made, are Edinburgh, Oxford, Greenwich, Cambridge, and Hamburg: the individual results very accordant; those from Cambridge strikingly so. Comparisons have also been made with the observations of Copenhagen, Kremsmunster, Cracow, and Wilna, which seem to shew considerable errors in the longitudes assigned to those observatories."

* Lieut. Gilliss became very favourably known to many members of this Society on his visit to England a few years ago. The observations made at Washington were published in 1846 by the order of the Senate, and have been very freely distributed here and on the continent. They are a proof of what may be done with moderate means by a skilful and conscientious observer.

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